

## 9/22: Energy and the Laws of Thermodynamics

---

### Chapter 2

**HW tonight: Complete the Ch 2  
quiz online; email me the  
results!**

### Law of Conservation of Mass

- Law of Conservation of Mass: Mass cannot be created or destroyed.
    - But...what about when wood burns and disappears?
    - Where does the material for a tree come from??
    - → Class vote!
-

## Video of Harvard Graduates...yikes!

[http://www.learner.org/vod/vod\\_window.html?pid=77](http://www.learner.org/vod/vod_window.html?pid=77)

---

## Revise and Review

- **Reply to your original vote. How has your idea about mass of a tree changed? Where does the material of a tree come from?**
  - **This is a very important idea. Hint, hint.**
-

## Energy Changes Are Governed by Two Scientific Laws

- First Law of Thermodynamics

- Energy input always = energy output
  - In other words, energy cannot be created or destroyed.
  - (Conservation of Energy)
- 

## Law of Conservation of Energy

- Law of Conservation of Energy: Energy cannot be created or destroyed. It can be stored and transferred in different forms.
  - What about when I drink Red Bull to “energize” myself?
  - What about the whole universe. Does the total amount of energy change?
-

## Energy Changes Are Governed by Two Scientific Laws

- Second Law of Thermodynamics
    - Energy always goes from a more useful to a less useful form when it is transferred
    - Entropy of the universe always increases.
  - Entropy: the tendency toward disorder.
    - Ex: without putting in work, your room will be messy. It *tends* toward *disorder*
- 

## Popcorn Relay

- Organize your teams from tallest → shortest
  - You will receive a handful of popcorn kernels
  - Your tasks:
    - Count and record! the # of kernels
    - One at a time (from tallest to shortest) run a course with a **COMPLETELY OPEN HAND**
    - When each person returns, carefully hand off the kernels to the next person
    - Count and record the # kernels again
    - Repeat until all 4 members have run
-

## Connecting the dots

1. What did handing off the seeds represent?
  2. What did the seeds remaining in the hand represent?
  3. What did the seeds falling represent?
-